GUIDELINES TO PREPARE AN ENVIRONMENTAL IMPACT STATEMENT FOR THE PROPOSED ELDORADO NUCLEAR URANIUM REFINERIES

Prepared by

Guidelines Task Force

K. Shikaze, Chairman

For

Chairman

Environmental Assessment Panel Office

Ottawa, Ontario

Environment Canada
Toronto, Ontario

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ENVIRONMENTAL IMPACT STATEMENT GUIDELINES

FOR

ELDORADO NUCLEAR LIMITED PLANT EXPANSION

INTRODUCTION

The guidelines provide an outline for the environmental impact statement to be prepared by Eldorado Nuclear Limited for its proposed plant expansion in Ontario and Saskatchewan. The requirements in these guidelines are presented in a manner that will lead to a totally objective review of the anticipated effects of the project on the recommended site from an environmental standpoint. Basic information on the need for the facilities in the form of details on the plant and its discharges is necessary to establish what will cause possible impacts on the environment. These are the requirements of Sections 1 and 3. Section 2 includes a discussion of the alternatives sites considered and the rationale for arriving at the recommended site. Sect 4 is an inventory of the environmental features and/or factors that must be considered in detail for the site. Section 5 is the assessment of the environmental impact by applying the basic plant information in Section 3 against the environmental information in Section 4 for the site. Section 6, identifies the basic information which should be included in the Overview Statement.

It is essential that all pertinent data be provided in the statement as a whole, and the proponent is encouraged to apply appropriate alternative methodologies in determining and assessing the environmental impact of the site.

1. RATIONALE FOR PROJECT

1.1 Describe purpose and need for project.

1.2 Briefly;

a) Outline alternatives already considered. (For example, why not expand at present location; were a number of smaller plants considered etc.?)

b) Summarize i) the reasons for elimination of alternatives;

ii) the reasons for selecting the proposed alternative over eliminated alternatives.

2. CONSIDERATION OF ALTERNATIVE SITES

An environmental review shall be provided of the alternative sites that were considered, the reasons why they have been eliminated from further consideration and/or the site selected was the preferred alternative. (Note: supporting reports, studies etc. should be referred to or appended.)

3. PROJECT DESCRIPTION

3.1 Describe the type of plant including:

a) the output products proposed for:

i) initial production

ii) anticipated or potential future production

b) a description of the processes proposed for both initial and anticipated future product production including process flow sheets, material inventories, transfer mechanisms, waste management, etc.

3.2 Describe the development schedule including:

a) details on the initial size of the plant

b) schedules for development to ultimate size

c) introduction dates for future new products (if available)

3.3 Identify the personnel requirements including:

a) number and phasing of work staff required including their qualifications and the expected origin of these staff (e.g. are they local residents?).

b) any special infrastructure requirements (e.g. social infrastructure - housing, recreation, services such as sewer, water, emergency, etc.).

3.4 Identify the input resources required including quantities and quality of:

a) raw materials such as yellow cake, (to include its concentrations of radionuclides and variations in its chemical characteristics), the method and location of storage sites.

b) process chemicals

c) water supply - cooling, sanitary and other

d) energy including fuel and electric power

e) transportation in the form of rail, road, water, etc.

3.5 All output from the plant including plant product and waste materials whether managed or not

a) shall be identified and quantified including all

i) liquid effluents such as

- sanitary wastewater
- process wastewater
- plant and surface runoff
- cooling water
- etc.

ii) gaseous emissions from

- cooling
- ventilation
- plant processes
- from any other source

iii) solid waste materials

- from plant processes
- as a result of treatment
- from any other source

iv) noise generation; and

v) any other discharges

b) shall be detailed with respect to:

i) their source within the plant processes

ii) rate of discharge

iii) periodicity (i.e. whether it is continuous, intermittent or otherwise)

iv) specific resource requirements such as land area, etc.

v) monitoring and control measures proposed

vi) quality and concentration both before and after controls that are proposed including information on chemical, biological and thermal characteristics

vii) radionuclides and their concentrations in solids and liquids, and the associated radioactivity

viii) principles of contingency measures proposed for upsets and spills and the consequences of such releases.

3.6 Plant life expectancy shall be outlined with consideration given to:

a) the impact that disposal of materials on the property might have with respect to future land use capability. (Some indication of the physical, chemical, biological and radiological surveillance proposed in this regard shall be provided.)

b) abandonment, subsequent or alternative uses

3.7 Any other factors judged significant

4. ENVIRONMENTAL DATA REQUIREMENTS

This section provides an outline of the requirements for environmental

baseline data on resources or conditions that could conceivably be effected by the project. The following requirements are by no means all inclusive and the proponent is encouraged to bring forward any other environmental features and/or factors that he feels may be significant during the course of the study.

4.1 Soil and geology

a) a physiographic description including:

i) topography

ii) drainage patterns

iii) any unique features

b) information on local geological features including:

i) hydrogeology

ii) bedrock depths and types

iii) specific properties such as faulting

iv) surficial deposits their composition, characteristics and distribution.

c) information on local pedological phenomenom including:

i) soil structure and stability

ii) porosity

iii) permeability

iv) ion exchange capacity

d) information in seismic activity

4.2 Air

Information is required respecting:

a) baseline meteorological data including:

i) climatic information

ii) wind speed, direction and frequency

iii) mixing heights and inversion probability

iv) air mass stability

v) predictiveness of climate

vi) etc.

b) air quality data within the area of potential impact

c) other sources of air pollutants in the area

d) phytotoxicological information if available

4.3 Water

a) surface water

i) for flowing streams and small enclosed water bodies the seasonal variations in

- rate of flow
- level
- quality
- etc.

ii) for larger water bodies such as the Great Lakes, littoral drift, shoreline erosion and or accretion

iii) for all surface waters it will be necessary to establish:

- lake or river bottom topography and impact of any proposed alterations
- sedimentation characteristics
- the effective mixing that can be accomplished on the effluent in receiving water
- ice - cover
  - duration
  - thickness
  - movement
- the influence of other sources of water pollutants

in the area

- any currents and their variation
- seasonal variations in the thermal regime
- etc.

iv) inventory of peripheral surface water

b) Ground water - Information shall include:

i) depth of water table, ground water/aquifer locations

ii) local and regional ground water uses

iii) underground flow in terms of both vertical and lateral movement on a local and regional basis

iv) seasonal water level variations

v) water quality

vi) quantity

vii) characteristics of the aquifer in terms of transmissivity, storage and whether it is confined or unconfined.

viii) identification of recharge and discharge areas

4.4 Biota

a) aquatic life

i) shall be documented with special emphasis on those areas that would be directly affected by water intakes and/or discharges

ii) documentation shall include:

- species occurrence
- species abundance
- the role of the affected region in the life cycle of the species (i.e. spawning areas, wintering areas, migration and staging areas, etc.)
- information on unique habitat

- rare and endangered species identification
- potential biomagnification

iii) the temperature requirements including a range of temperature tolerances should be developed based on the level of activity and the life stages of the aquatic life at various times of the year.

b) Terrestrial

i) terrestrial ecosystems shall be identified as to their:

- composition
- interdependencies
- requirements
- degree of sensitivity to the various kinds of discharges to be expexted
- potential for biomagnification

ii) unique or sensitive habitat areas such as migration routes, corridors etc., shall be identified

iii) any rare or endangered species shall also be identified

4.5 Land and Water Uses

This section shall include:

a) an inventory of present and potential land and water uses

b) any zoning regulations and/or official plans for the area pertaining to land or water use

c) potential use conflicts or use restrictions

d) land uses such as recreational, residential, industrial and agricultural (in production or out of production) both existing and potential

e) historical and archaeological information on the area

f) details respecting forestry, mining and reserves etc.

g) use level and value of the sport and/or commercial fisheries

h) any other information seen to be of consequence

4.6 Social and community factors.

Information required shall include:

a) population; regional and local

b) population distribution

c) labour availability and type

d) approximate wage levels in the local community

e) education

f) social and recreational resources

g) transportation routes - including identification of sensitive areas with respect to possible spills of harzardous substances etc., and other environmental effects e.g. noise

h) town and regional plans

i) any other information seen to be of consequence

4.7 Noise

Information shall be provided to the extent possible on background levels in each of the area studies.

5. ASSESSMENT OF ENVIRONMENTAL IMPACT

5.1 Summarize the effect of the project on the environment as identified above.

5.2 Note the environmental impacts that can be minimized by using good environmental design, and evaluate the anticipated eventual status of the impacts.

5.3 Identify and quantify all residual short and long term impacts, both positive and negative; including those where there is no mitigation proposed or where mitigation may fail or be only partly effective.

5.4 Based on the foregoing, determine the total environmental impact of the project including those impacts which may be cumulative and/or synergistic.

6. OVERVIEW SUMMARY

The overview summary should consolidate the important findings of the report and should be written in such a manner as to allow reviewers to focus immediately on items of concern. It should be written in terms understandable to the general public and in a format that allows it to be extracted directly for publication by the media, or for use by senior executives requiring a quick appraisal of the situation.

The overview summary should briefly describe the project, the probable major environmental impacts, the ameliorating and mitigating measures to be implemented by the assessor, and the significance of the residual unmitigated environmental impacts. Any aspects of the development which might stimulate public concern should be described with particular clarity. The summary should also clearly identify data gaps or knowledge deficiencies, and the limitations they have imposed on the Environmental Impact Statement.